OIPE JC16
OCT 12 2004
PATENT & TRADEMARK OFFICE

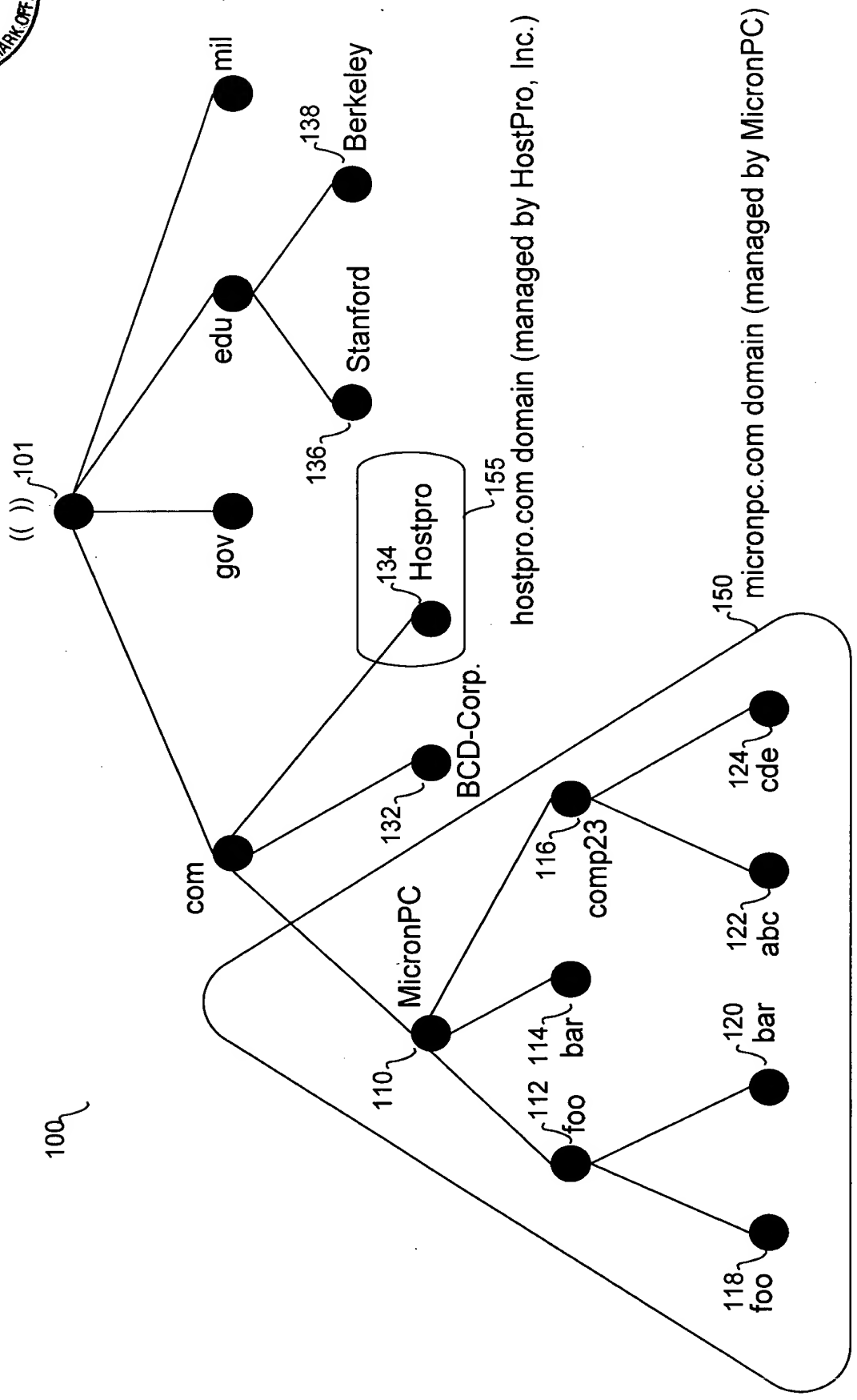


FIG. 1A (PRIOR ART)

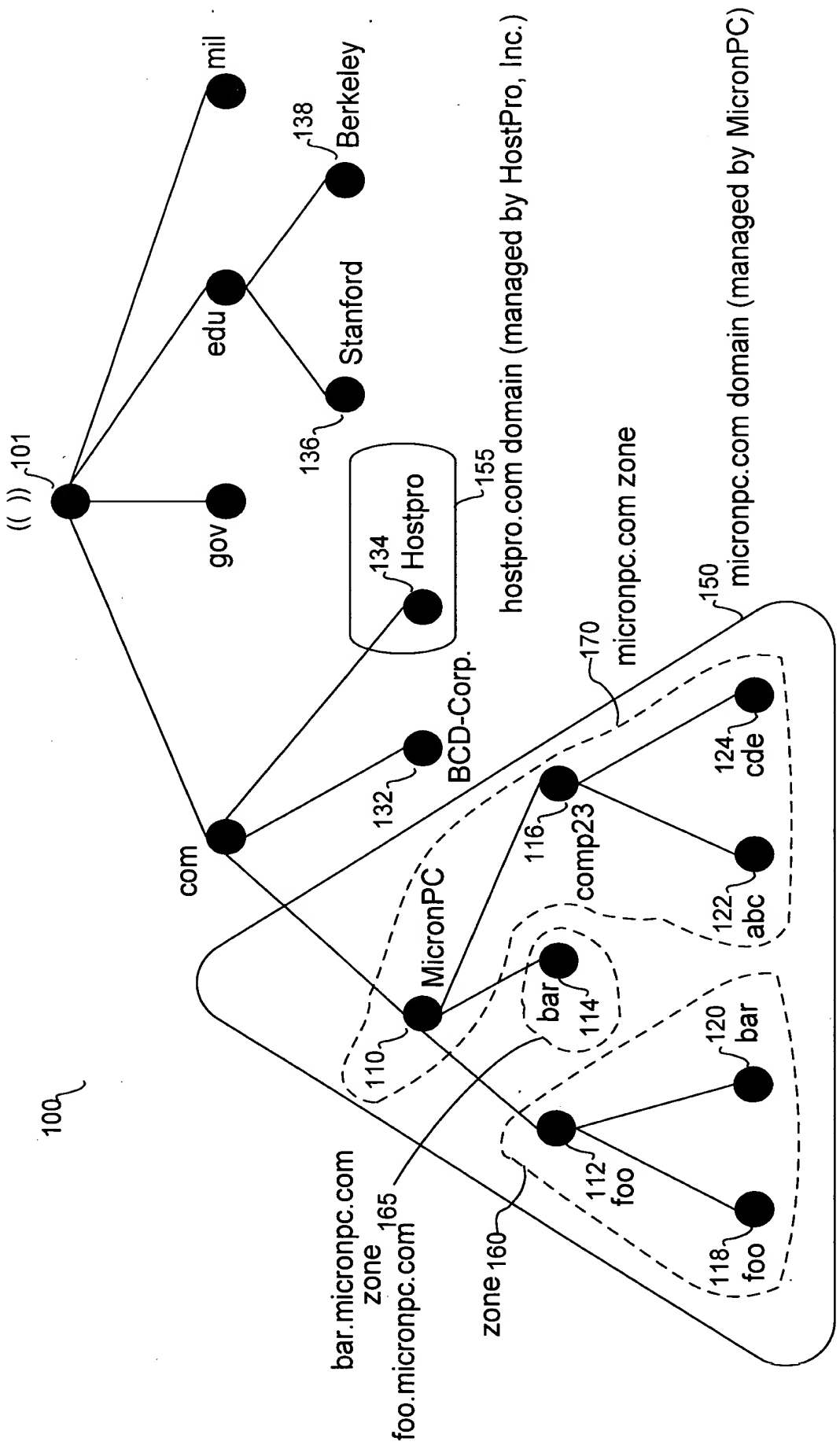


FIG. 1B (PRIOR ART)

Example Configuration Data File for the Primary Name Server of the foo.MicronPC.com Zone

```
primary          foo.MicronPC.com          db.foo.MicronPC
primary          standford.edu             db.stanford
    :
    :
```

FIG. 2A

Example db.foo.MicronPC Zone Data File for the foo.MicronPC.com Zone

```
foo.MicronPC.com.   IN    SOA    nsl.HostPro.com        postmaster.HostPro.com.

;;; information for slave name servers
            1837        ;;; serial number for this version of the zone data file
            1800        ;;; refresh after 30 minutes
             900        ;;; retry after 15 minutes
           86400        ;;; expire after 1 week
            1800        ;;; minimum Time To Live (TTL) of 30 minutes
              )

;;; name servers for the zone
            IN          NS          nsl.HostPro.com.
            IN          NS          bar

;;; mail server
            IN          MX          5  mailserver.HostPro.com.

;;; addresses
      @          IN          A          216.23.39.188
      foo        IN          A          216.23.39.180
      bar        IN          A          216.23.46.83

;;; aliases
      stmp       IN     CNAME           @
      www        IN     CNAME           @
      ftp        IN     CNAME           foo.foo.MicronPC.com.
      bigdaddy   IN     CNAME           bar
```

FIG. 2B

Example Partial Zone Data File for the MicronPC.com Zone

;;; delegation of subzone foo.MicroPC.com to authoritative name servers for the subzone

foo	86400	IN	NS	nsl.HostPro.com.
	86400	IN	NS	bar.foo.MicronPC.com.
bar.foo.MicronPC.com.	86400	IN	A	216.23.46.83

FIG. 2C

Example DDIU Update File

	363	*365*
362	<path-1>/db.foo.MicronPC	modified
364	<path-2>/db.foo.MicronPC	modified
366	<path-3>/db.abcd	deleted
	:	
	:	

FIG. 3B

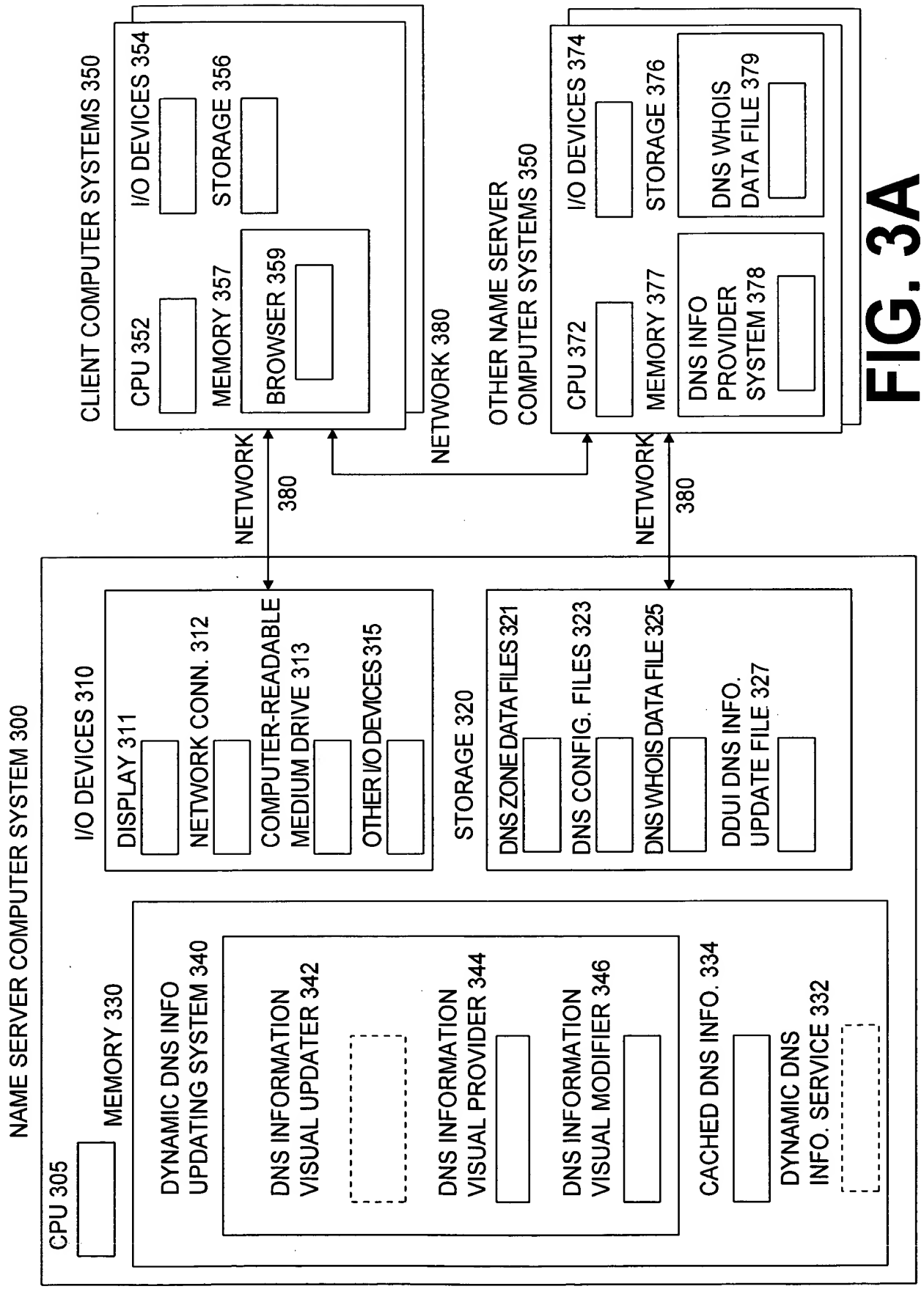

NAME SERVER COMPUTER SYSTEM 300
CPU 305
MEMORY 330
DYNAMIC DNS INFO UPDATING SYSTEM 340
DNS INFORMATION VISUAL UPDATER 342
DNS INFORMATION VISUAL PROVIDER 344
DNS INFORMATION VISUAL MODIFIER 346
CACHED DNS INFO. 334
DYNAMIC DNS INFO. SERVICE 332
I/O DEVICES 310
DISPLAY 311
NETWORK CONN. 312
COMPUTER-READABLE MEDIUM DRIVE 313
OTHER I/O DEVICES 315
STORAGE 320
DNS ZONE DATA FILES 321
DNS CONFIG. FILES 323
DNS WHOIS DATA FILE 325
DDUI DNS INFO. UPDATE FILE 327
NETWORK 380
NETWORK 380
CLIENT COMPUTER SYSTEMS 350
CPU 352
MEMORY 357
BROWSER 359
I/O DEVICES 354
STORAGE 356
NETWORK 380
OTHER NAME SERVER COMPUTER SYSTEMS 350
CPU 372
MEMORY 377
DNS INFO PROVIDER SYSTEM 378
I/O DEVICES 374
STORAGE 376
DNS WHOIS DATA FILE 379

FIG. 3A

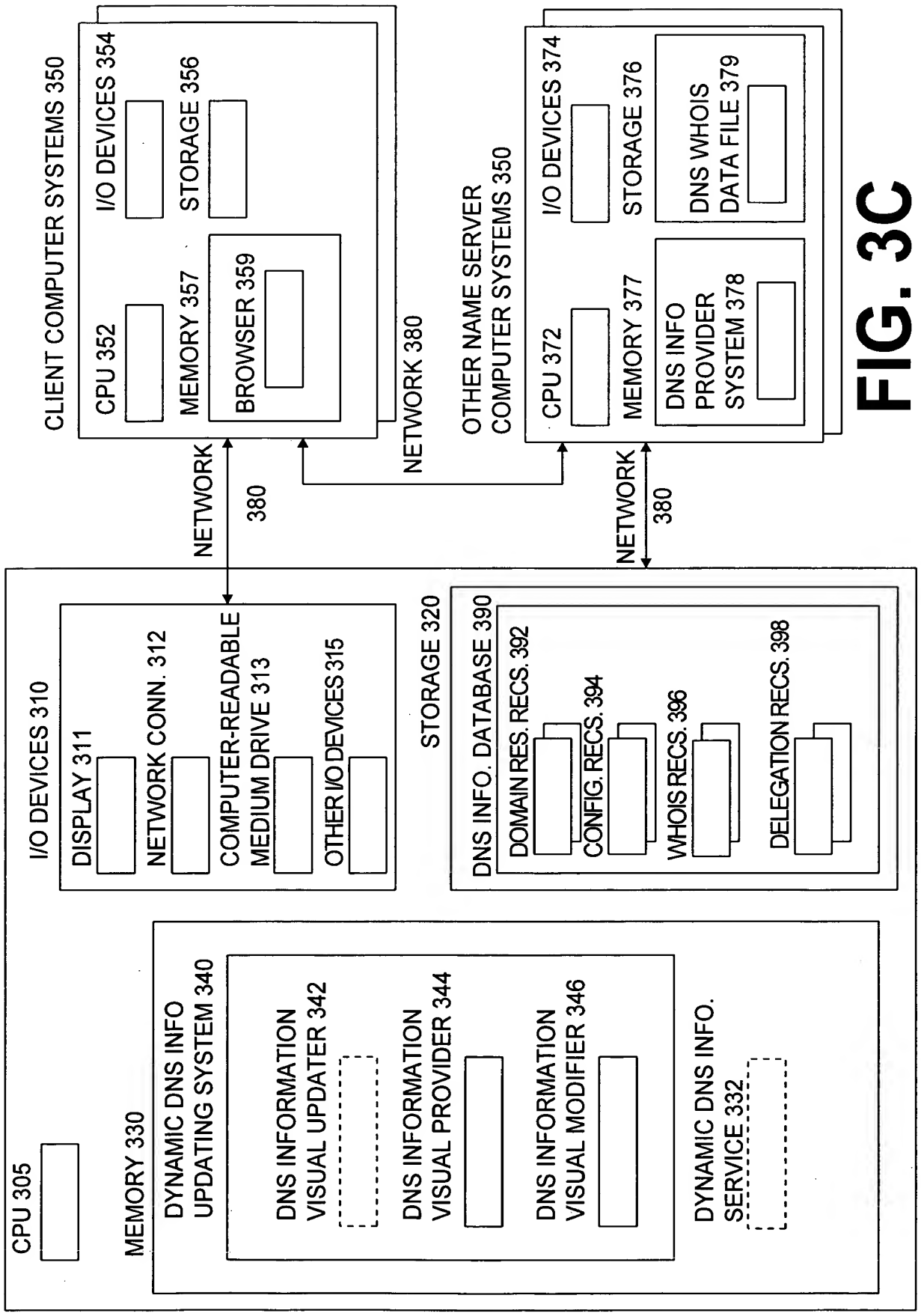

NAME SERVER COMPUTER SYSTEM 300
CPU 305
MEMORY 330
DYNAMIC DNS INFO UPDATING SYSTEM 340
DNS INFORMATION VISUAL UPDATER 342
DNS INFORMATION VISUAL PROVIDER 344
DNS INFORMATION VISUAL MODIFIER 346
DYNAMIC DNS INFO. SERVICE 332
I/O DEVICES 310
DISPLAY 311
NETWORK CONN. 312
COMPUTER-READABLE MEDIUM DRIVE 313
OTHER I/O DEVICES 315
STORAGE 320
DNS INFO. DATABASE 390
DOMAIN RES. RECS. 392
CONFIG. RECS. 394
WHOIS RECS. 396
DELEGATION RECS. 398
NETWORK 380
NETWORK 380
CLIENT COMPUTER SYSTEMS 350
CPU 352
MEMORY 357
BROWSER 359
I/O DEVICES 354
STORAGE 356
NETWORK 380
OTHER NAME SERVER COMPUTER SYSTEMS 350
CPU 372
MEMORY 377
DNS INFO PROVIDER SYSTEM 378
I/O DEVICES 374
STORAGE 376
DNS WHOIS DATA FILE 379

FIG. 3C

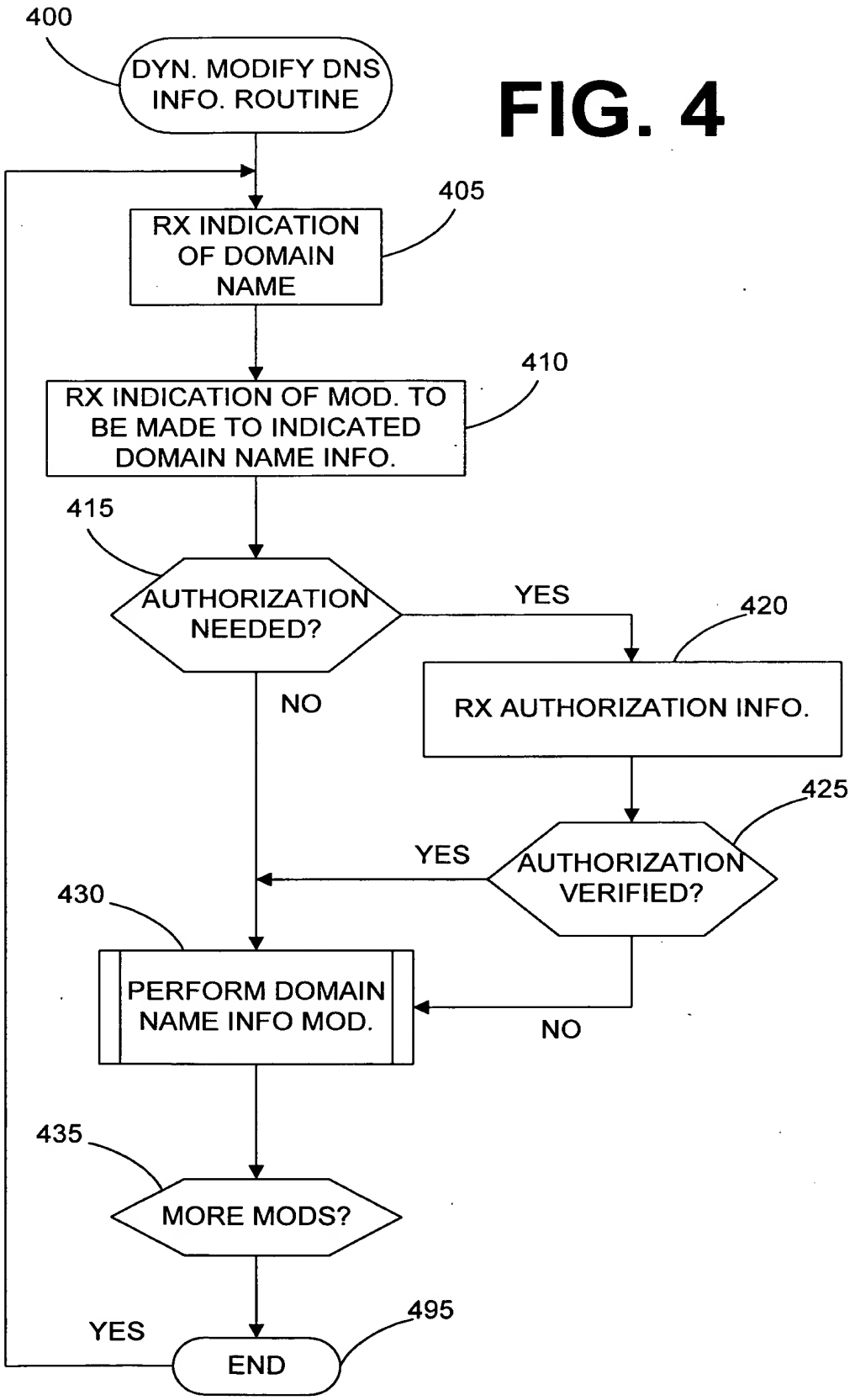

400
DYN. MODIFY DNS INFO. ROUTINE
405
RX INDICATION OF DOMAIN NAME
410
RX INDICATION OF MOD. TO BE MADE TO INDICATED DOMAIN NAME INFO.
415
AUTHORIZATION NEEDED?
YES
420
RX AUTHORIZATION INFO.
NO
425
AUTHORIZATION VERIFIED?
YES
430
PERFORM DOMAIN NAME INFO MOD.
NO
435
MORE MODS?
YES
495
END

FIG. 4

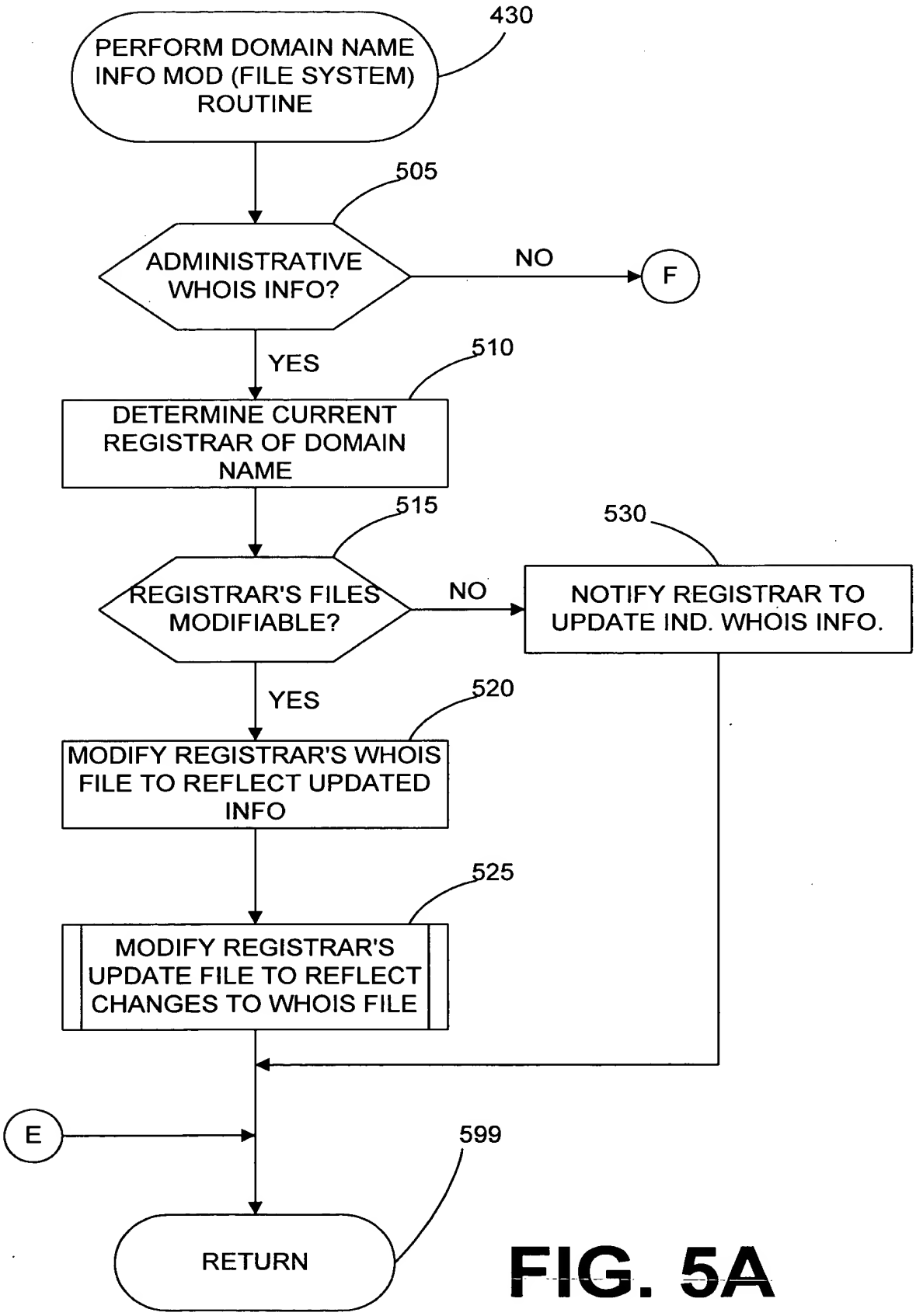

430
PERFORM DOMAIN NAME INFO MOD (FILE SYSTEM) ROUTINE
505
ADMINISTRATIVE WHOIS INFO?
NO
F
YES
510
DETERMINE CURRENT REGISTRAR OF DOMAIN NAME
515
REGISTRAR'S FILES MODIFIABLE?
NO
530
NOTIFY REGISTRAR TO UPDATE IND. WHOIS INFO.
YES
520
MODIFY REGISTRAR'S WHOIS FILE TO REFLECT UPDATED INFO
525
MODIFY REGISTRAR'S UPDATE FILE TO REFLECT CHANGES TO WHOIS FILE
E
599
RETURN

FIG. 5A

FIG. 5B

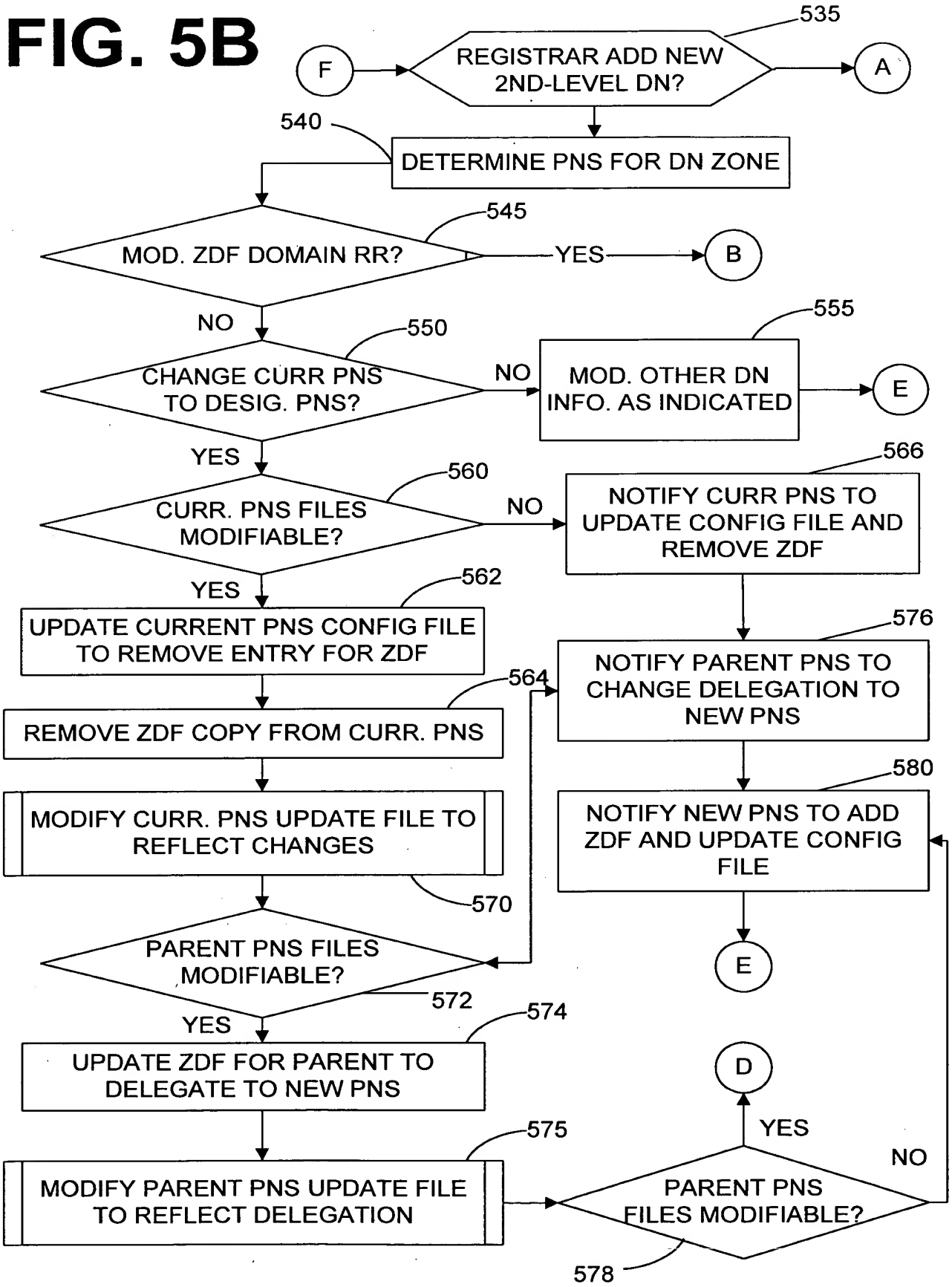
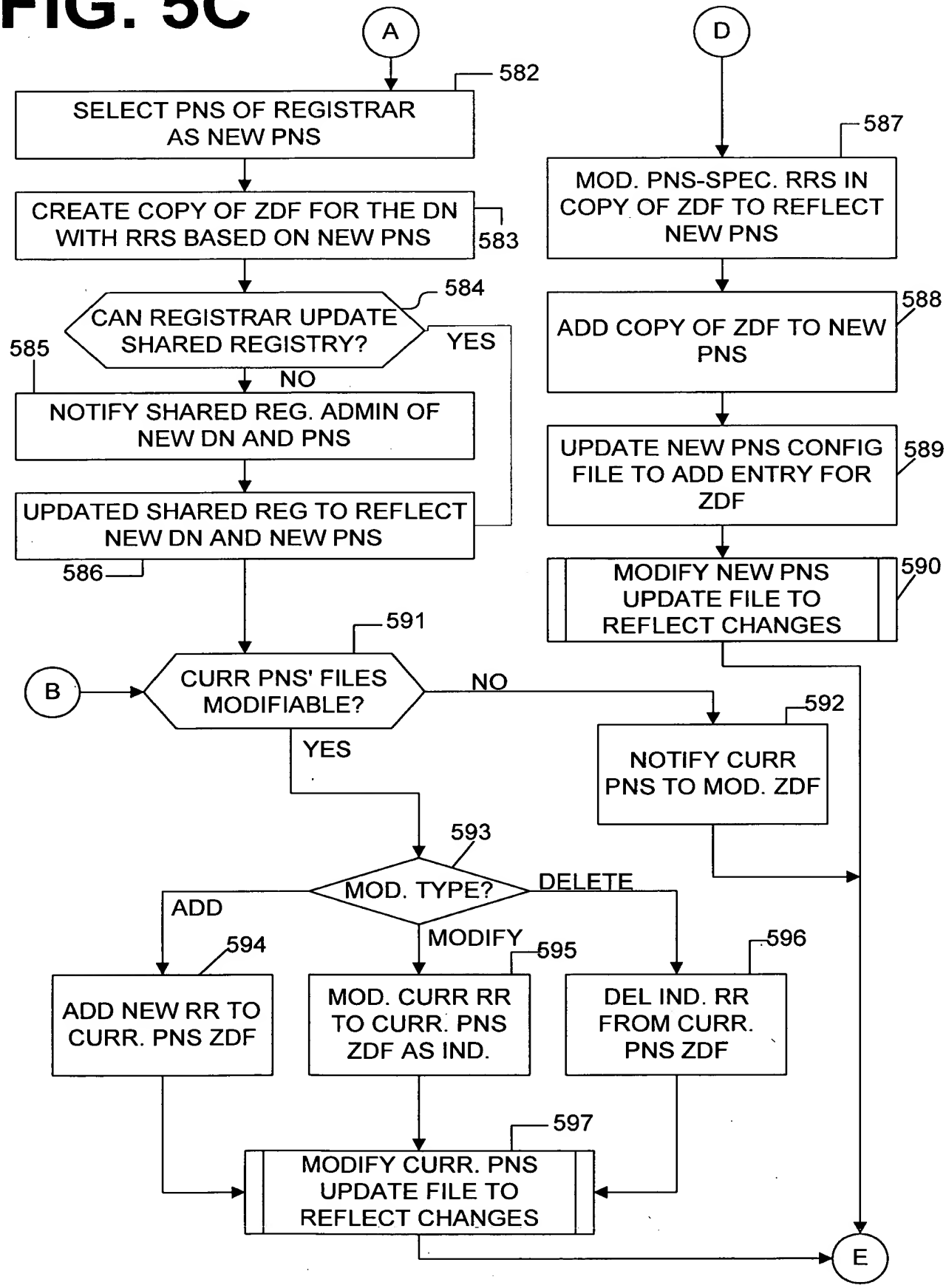

F
REGISTRAR ADD NEW 2ND-LEVEL DN?
535
A
540
DETERMINE PNS FOR DN ZONE
545
MOD. ZDF DOMAIN RR?
YES
B
NO
550
CHANGE CURR PNS TO DESIG. PNS?
NO
555
MOD. OTHER DN INFO. AS INDICATED
E
YES
560
CURR. PNS FILES MODIFIABLE?
NO
566
NOTIFY CURR PNS TO UPDATE CONFIG FILE AND REMOVE ZDF
YES
562
UPDATE CURRENT PNS CONFIG FILE TO REMOVE ENTRY FOR ZDF
576
NOTIFY PARENT PNS TO CHANGE DELEGATION TO NEW PNS
564
REMOVE ZDF COPY FROM CURR. PNS
580
NOTIFY NEW PNS TO ADD ZDF AND UPDATE CONFIG FILE
MODIFY CURR. PNS UPDATE FILE TO REFLECT CHANGES
570
E
PARENT PNS FILES MODIFIABLE?
572
YES
574
UPDATE ZDF FOR PARENT TO DELEGATE TO NEW PNS
D
YES
575
NO
MODIFY PARENT PNS UPDATE FILE TO REFLECT DELEGATION
PARENT PNS FILES MODIFIABLE?
578

FIG. 5C


A
D
582
SELECT PNS OF REGISTRAR AS NEW PNS
587
MOD. PNS-SPEC. RRS IN COPY OF ZDF TO REFLECT NEW PNS
CREATE COPY OF ZDF FOR THE DN WITH RRS BASED ON NEW PNS
583
584
CAN REGISTRAR UPDATE SHARED REGISTRY?
YES
588
ADD COPY OF ZDF TO NEW PNS
585
NO
NOTIFY SHARED REG. ADMIN OF NEW DN AND PNS
UPDATE NEW PNS CONFIG FILE TO ADD ENTRY FOR ZDF
589
UPDATED SHARED REG TO REFLECT NEW DN AND NEW PNS
586
MODIFY NEW PNS UPDATE FILE TO REFLECT CHANGES
590
591
B
CURR PNS' FILES MODIFIABLE?
NO
592
NOTIFY CURR PNS TO MOD. ZDF
YES
593
MOD. TYPE?
DELETE
ADD
MODIFY
594
595
596
ADD NEW RR TO CURR. PNS ZDF
MOD. CURR RR TO CURR. PNS ZDF AS IND.
DEL IND. RR FROM CURR. PNS ZDF
597
MODIFY CURR. PNS UPDATE FILE TO REFLECT CHANGES
E

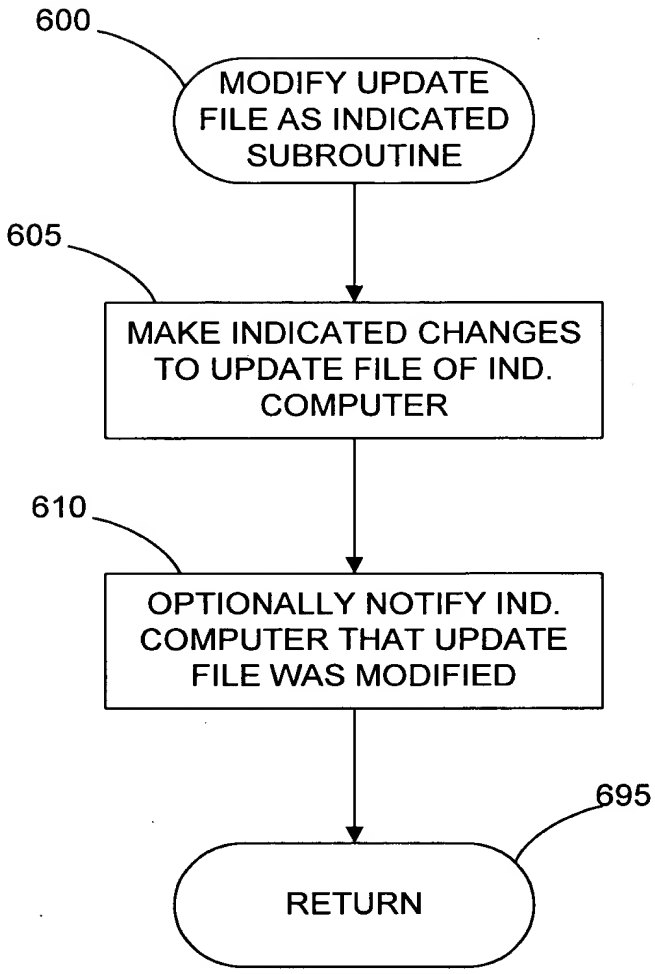

600
MODIFY UPDATE FILE AS INDICATED SUBROUTINE
605
MAKE INDICATED CHANGES TO UPDATE FILE OF IND. COMPUTER
610
OPTIONALLY NOTIFY IND. COMPUTER THAT UPDATE FILE WAS MODIFIED
695
RETURN

FIG. 6

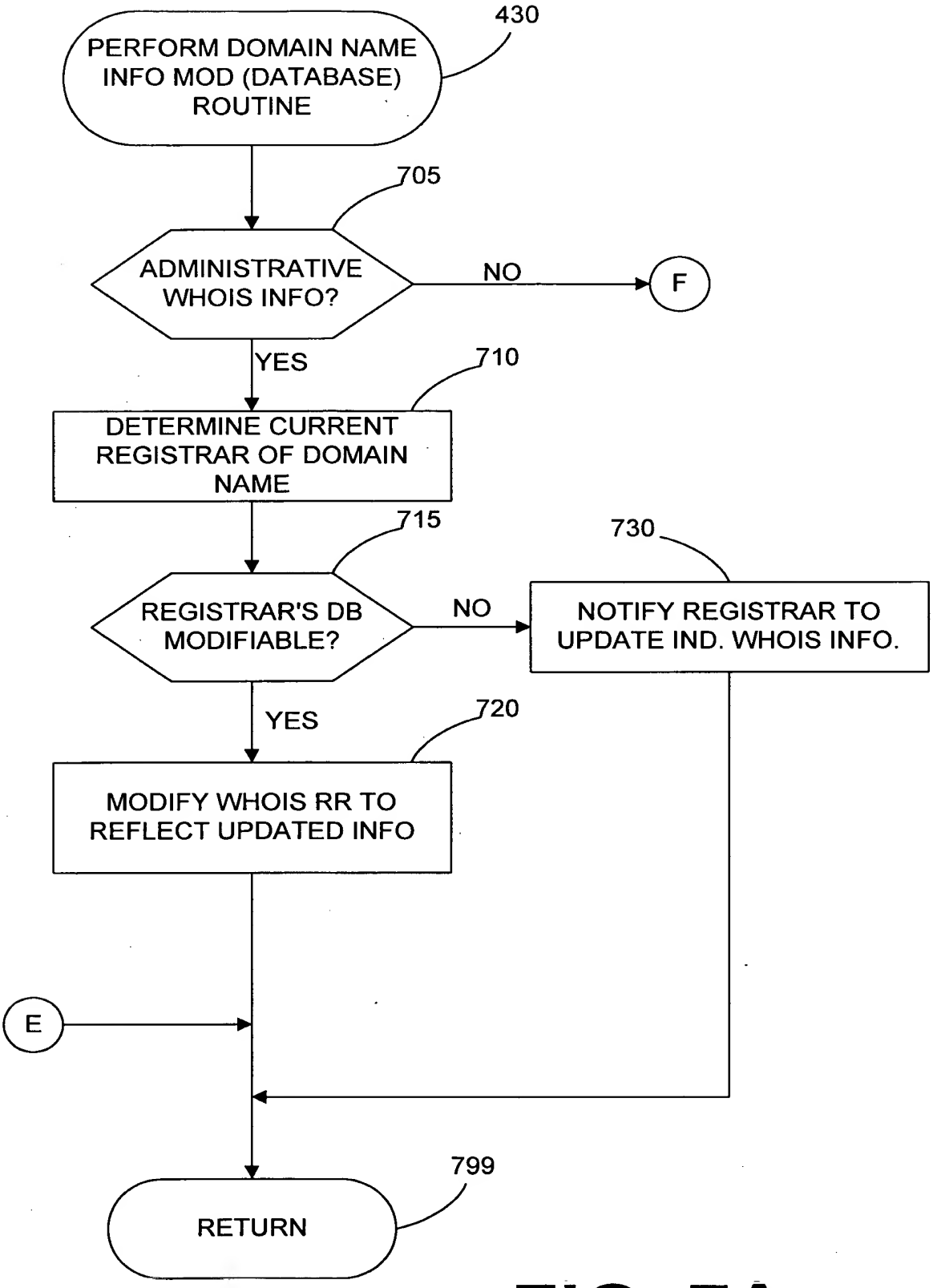

430
PERFORM DOMAIN NAME INFO MOD (DATABASE) ROUTINE
705
ADMINISTRATIVE WHOIS INFO?
NO
F
YES
710
DETERMINE CURRENT REGISTRAR OF DOMAIN NAME
715
730
REGISTRAR'S DB MODIFIABLE?
NO
NOTIFY REGISTRAR TO UPDATE IND. WHOIS INFO.
YES
720
MODIFY WHOIS RR TO REFLECT UPDATED INFO
E
799
RETURN

FIG. 7A

FIG. 7B

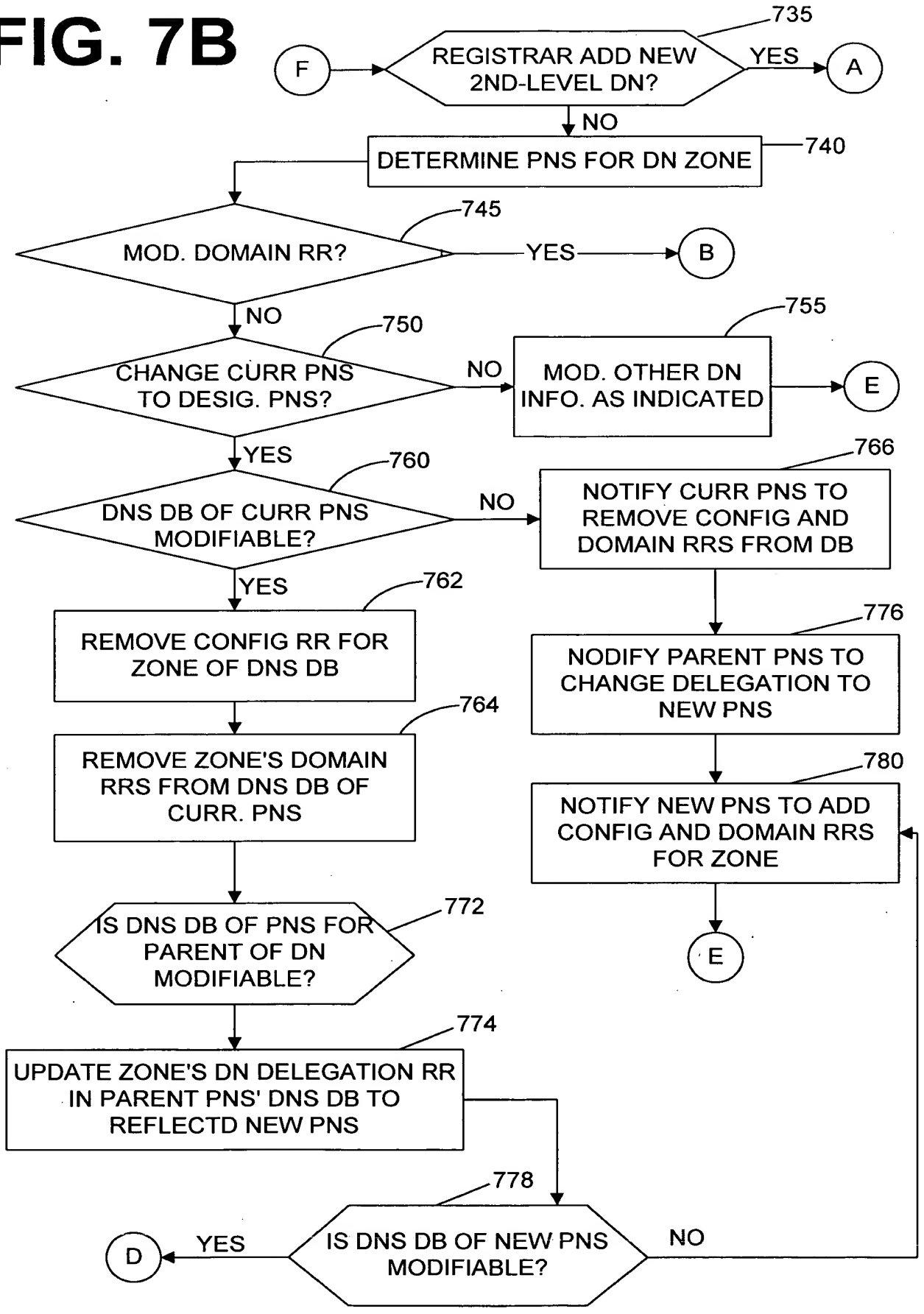
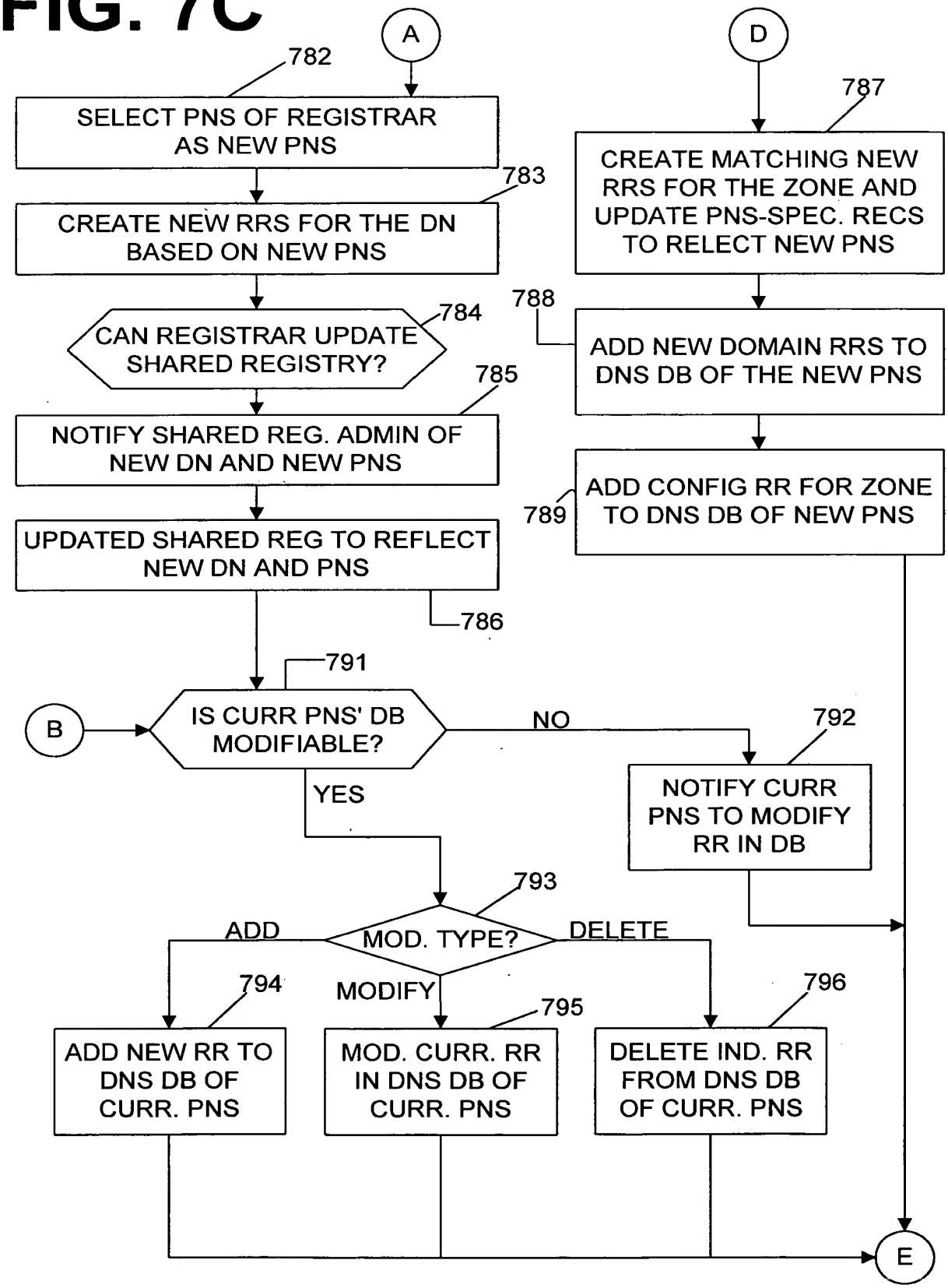

F
735
REGISTRAR ADD NEW 2ND-LEVEL DN?
YES
A
NO
740
DETERMINE PNS FOR DN ZONE
745
MOD. DOMAIN RR?
YES
B
NO
750
CHANGE CURR PNS TO DESIG. PNS?
NO
755
MOD. OTHER DN INFO. AS INDICATED
E
YES
760
DNS DB OF CURR PNS MODIFIABLE?
NO
766
NOTIFY CURR PNS TO REMOVE CONFIG AND DOMAIN RRS FROM DB
YES
762
REMOVE CONFIG RR FOR ZONE OF DNS DB
776
NODIFY PARENT PNS TO CHANGE DELEGATION TO NEW PNS
764
REMOVE ZONE'S DOMAIN RRS FROM DNS DB OF CURR. PNS
780
NOTIFY NEW PNS TO ADD CONFIG AND DOMAIN RRS FOR ZONE
772
IS DNS DB OF PNS FOR PARENT OF DN MODIFIABLE?
E
774
UPDATE ZONE'S DN DELEGATION RR IN PARENT PNS' DNS DB TO REFLECTD NEW PNS
778
IS DNS DB OF NEW PNS MODIFIABLE?
YES
D
NO

FIG. 7C


A
D
782
SELECT PNS OF REGISTRAR AS NEW PNS
783
CREATE NEW RRS FOR THE DN BASED ON NEW PNS
784
CAN REGISTRAR UPDATE SHARED REGISTRY?
785
NOTIFY SHARED REG. ADMIN OF NEW DN AND NEW PNS
UPDATED SHARED REG TO REFLECT NEW DN AND PNS
786
787
CREATE MATCHING NEW RRS FOR THE ZONE AND UPDATE PNS-SPEC. RECS TO RELECT NEW PNS
788
ADD NEW DOMAIN RRS TO DNS DB OF THE NEW PNS
789
ADD CONFIG RR FOR ZONE TO DNS DB OF NEW PNS
791
B
IS CURR PNS' DB MODIFIABLE?
NO
792
NOTIFY CURR PNS TO MODIFY RR IN DB
YES
793
ADD
MOD. TYPE?
DELETE
MODIFY
794
795
796
ADD NEW RR TO DNS DB OF CURR. PNS
MOD. CURR. RR IN DNS DB OF CURR. PNS
DELETE IND. RR FROM DNS DB OF CURR. PNS
E

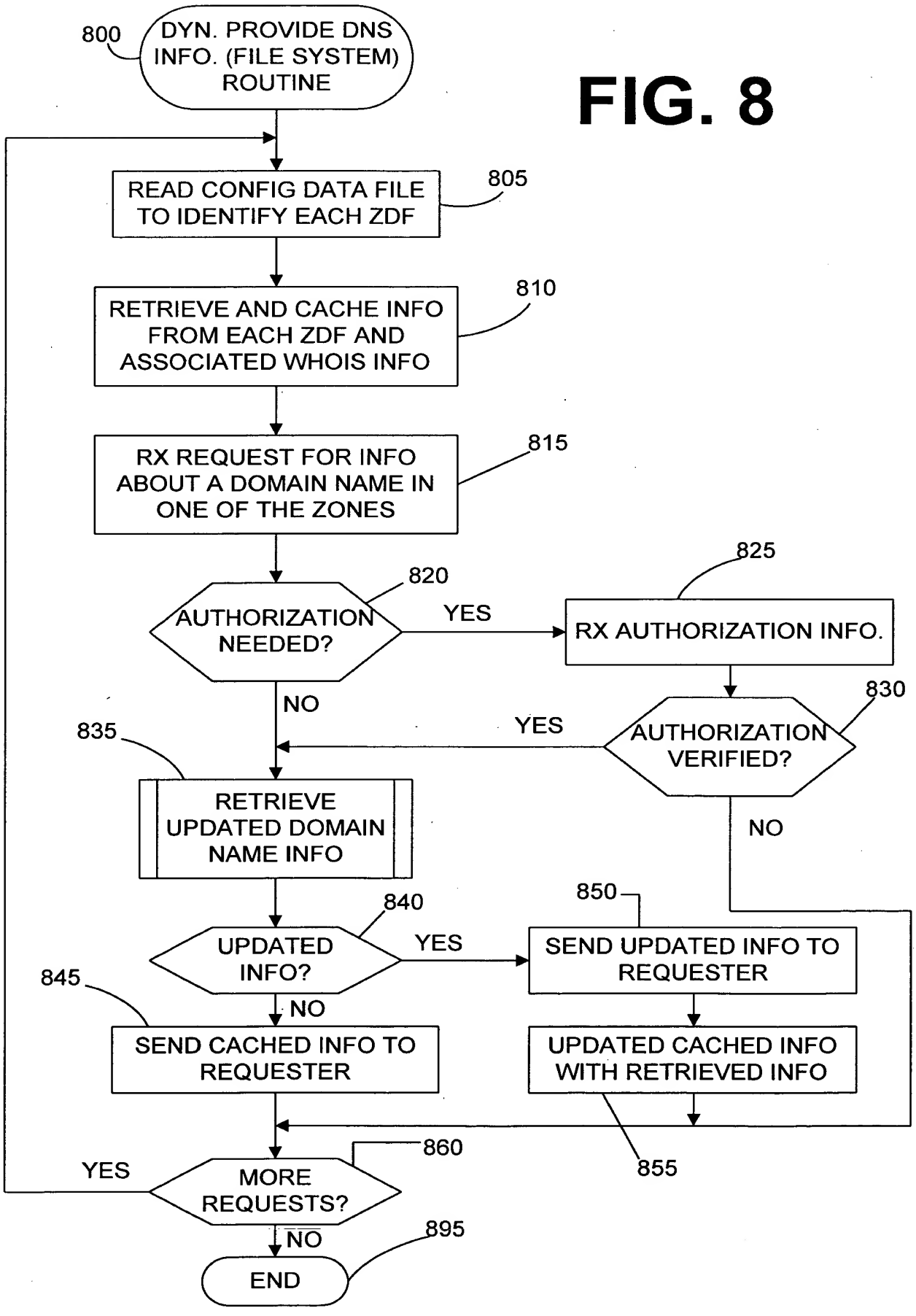

800
DYN. PROVIDE DNS INFO. (FILE SYSTEM) ROUTINE
READ CONFIG DATA FILE TO IDENTIFY EACH ZDF
805
RETRIEVE AND CACHE INFO FROM EACH ZDF AND ASSOCIATED WHOIS INFO
810
RX REQUEST FOR INFO ABOUT A DOMAIN NAME IN ONE OF THE ZONES
815
AUTHORIZATION NEEDED?
820
YES
RX AUTHORIZATION INFO.
825
AUTHORIZATION VERIFIED?
830
YES
NO
NO
835
RETRIEVE UPDATED DOMAIN NAME INFO
UPDATED INFO?
840
YES
SEND UPDATED INFO TO REQUESTER
850
845
NO
SEND CACHED INFO TO REQUESTER
UPDATED CACHED INFO WITH RETRIEVED INFO
855
MORE REQUESTS?
860
YES
NO
END
895

FIG. 8

FIG. 9

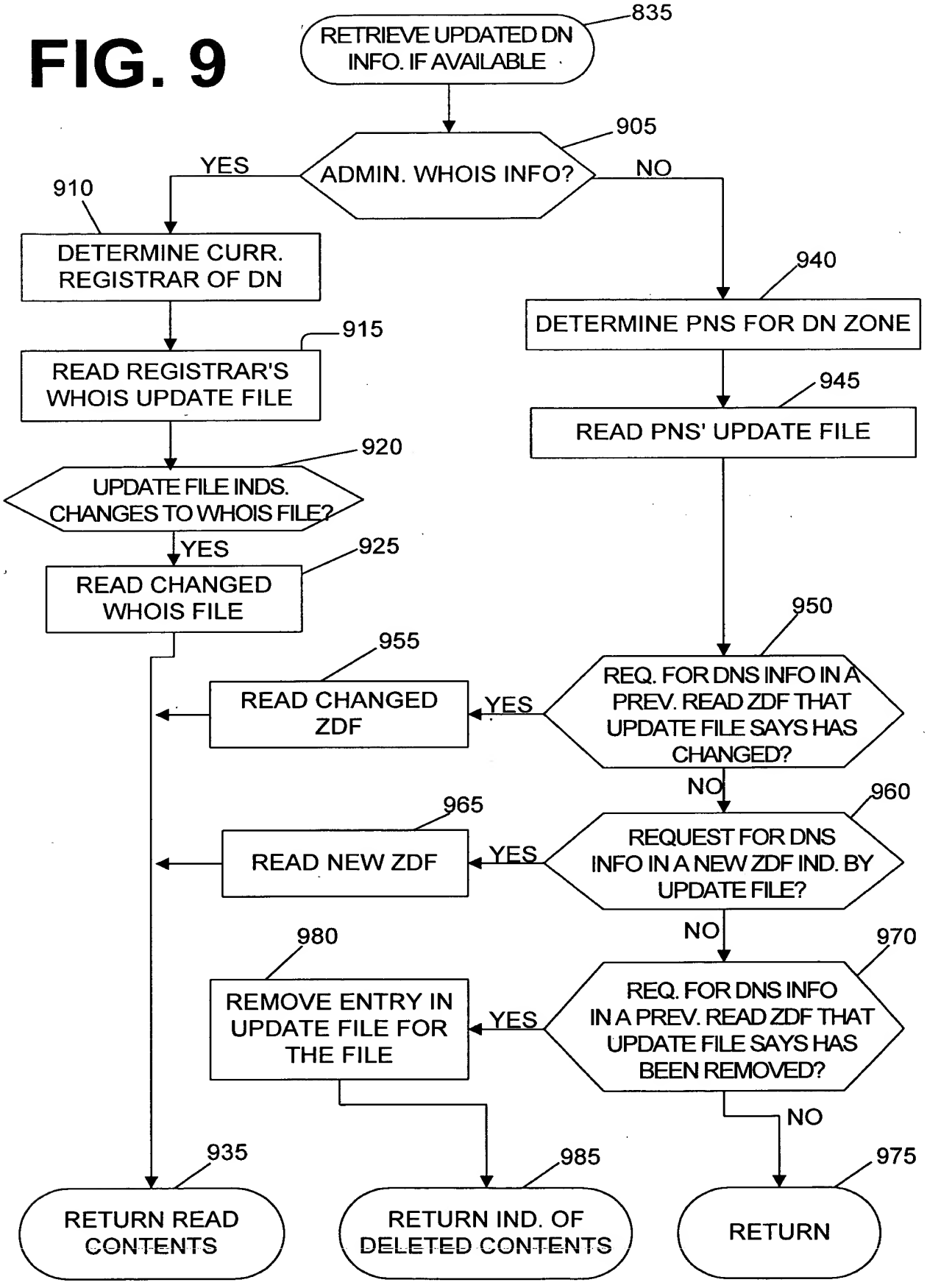

RETRIEVE UPDATED DN INFO. IF AVAILABLE
835
ADMIN. WHOIS INFO?
905
YES
NO
910
DETERMINE CURR. REGISTRAR OF DN
915
READ REGISTRAR'S WHOIS UPDATE FILE
920
UPDATE FILE INDS. CHANGES TO WHOIS FILE?
YES
925
READ CHANGED WHOIS FILE
940
DETERMINE PNS FOR DN ZONE
945
READ PNS' UPDATE FILE
950
REQ. FOR DNS INFO IN A PREV. READ ZDF THAT UPDATE FILE SAYS HAS CHANGED?
YES
955
READ CHANGED ZDF
NO
960
REQUEST FOR DNS INFO IN A NEW ZDF IND. BY UPDATE FILE?
YES
965
READ NEW ZDF
NO
970
REQ. FOR DNS INFO IN A PREV. READ ZDF THAT UPDATE FILE SAYS HAS BEEN REMOVED?
YES
980
REMOVE ENTRY IN UPDATE FILE FOR THE FILE
NO
935
RETURN READ CONTENTS
985
RETURN IND. OF DELETED CONTENTS
975
RETURN

FIG. 10

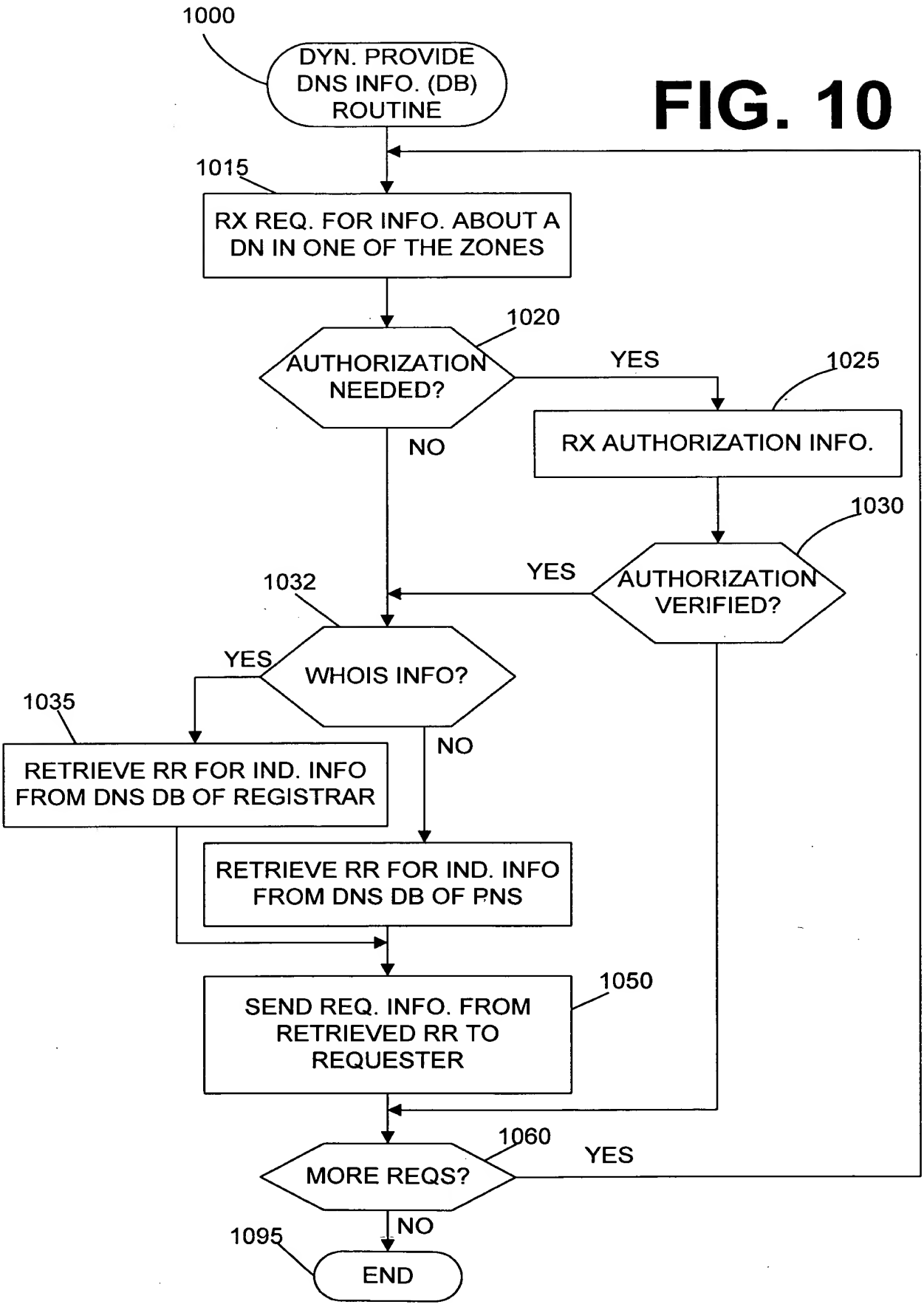

1000
DYN. PROVIDE DNS INFO. (DB) ROUTINE
1015
RX REQ. FOR INFO. ABOUT A DN IN ONE OF THE ZONES
1020
AUTHORIZATION NEEDED?
YES
1025
RX AUTHORIZATION INFO.
NO
1030
AUTHORIZATION VERIFIED?
YES
1032
WHOIS INFO?
YES
1035
RETRIEVE RR FOR IND. INFO FROM DNS DB OF REGISTRAR
NO
RETRIEVE RR FOR IND. INFO FROM DNS DB OF PNS
1050
SEND REQ. INFO. FROM RETRIEVED RR TO REQUESTER
1060
MORE REQS?
YES
NO
1095
END

FIG. 11A

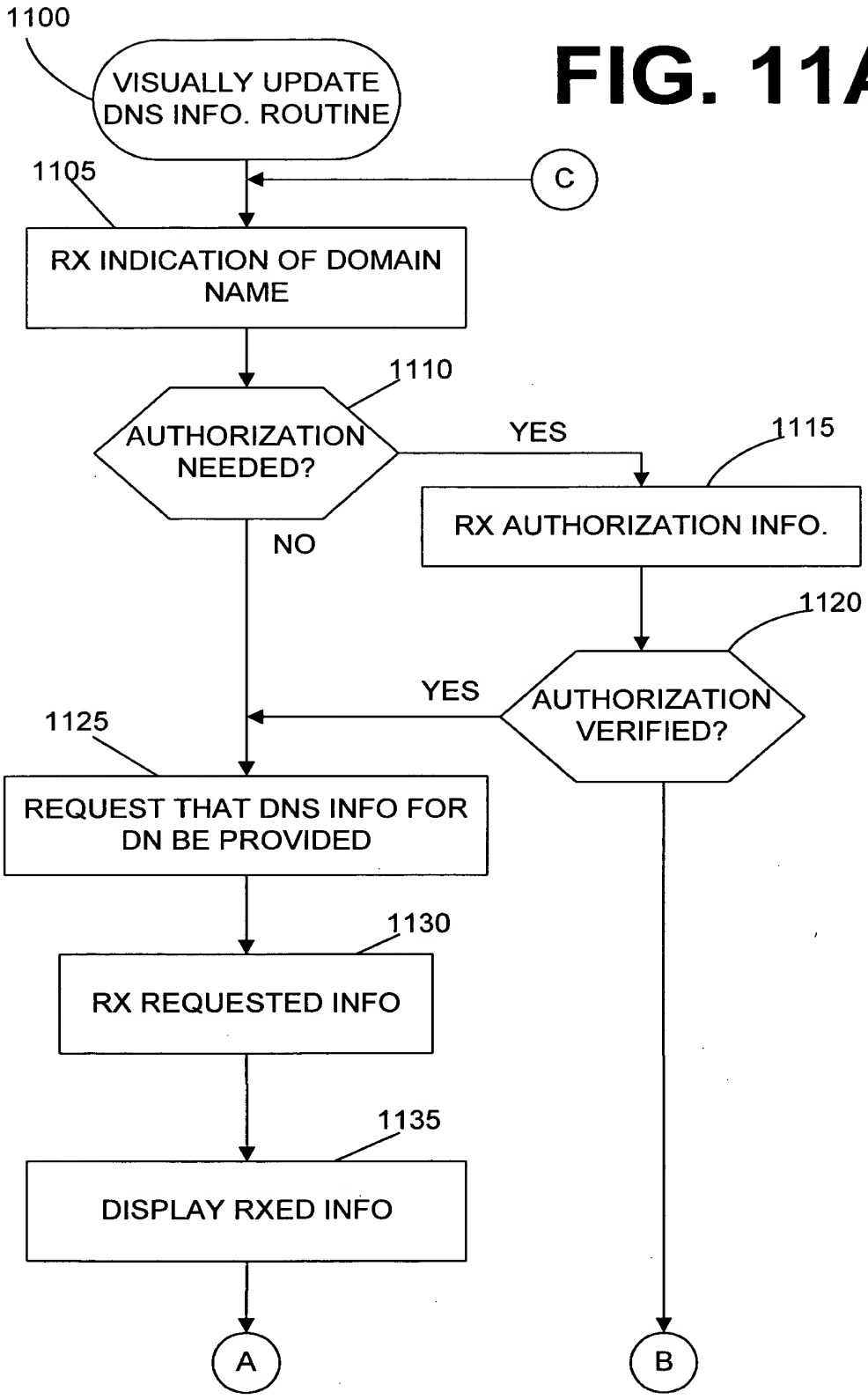
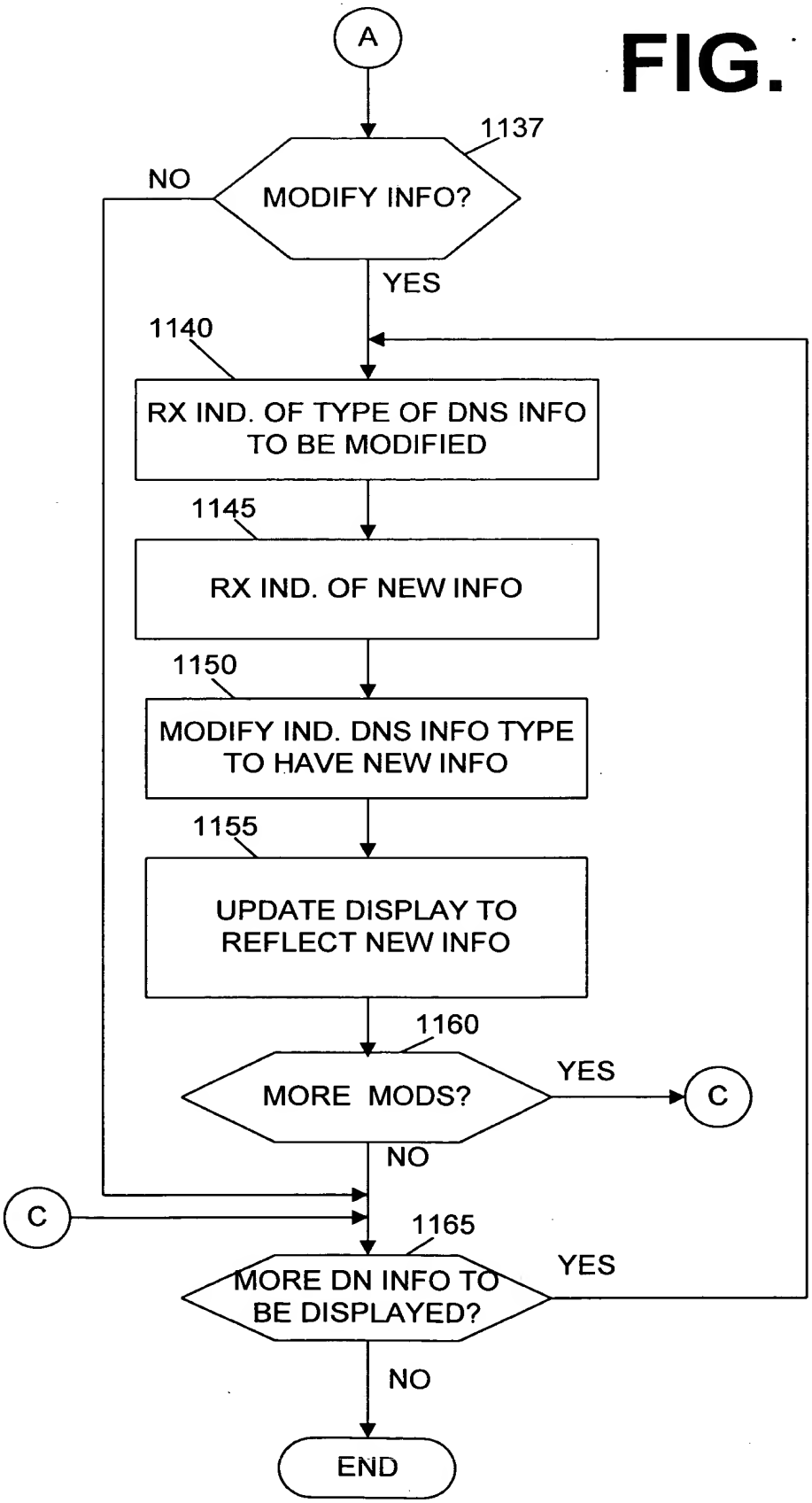

1100
VISUALLY UPDATE DNS INFO. ROUTINE
C
1105
RX INDICATION OF DOMAIN NAME
1110
AUTHORIZATION NEEDED?
YES
1115
RX AUTHORIZATION INFO.
NO
1120
AUTHORIZATION VERIFIED?
YES
1125
REQUEST THAT DNS INFO FOR DN BE PROVIDED
1130
RX REQUESTED INFO
1135
DISPLAY RXED INFO
A
B

FIG. 11B


A
1137
MODIFY INFO?
NO
YES
1140
RX IND. OF TYPE OF DNS INFO TO BE MODIFIED
1145
RX IND. OF NEW INFO
1150
MODIFY IND. DNS INFO TYPE TO HAVE NEW INFO
1155
UPDATE DISPLAY TO REFLECT NEW INFO
1160
MORE MODS?
YES
C
NO
C
1165
MORE DN INFO TO BE DISPLAYED?
YES
NO
END